Claims

1. A compound of formula (I)

Y^1-(NH-X^1-C=O)-(NH-X^2-C=O)-(NH-X^3-C=O)-(NH-X^4-C=O)-
(NH-X^5-C=O)-(NH-X^6-C=O)-Y^2 (I),

wherein Y^1 is either

a) a hydrogen or

b) a methyl group or

c) an acetyl group or

d) is characterized by a backbone consisting of a chain of 1 to 32 carbon atoms,

wherein (NH-X^1-C=O) is a basic amino acid residue, preferably

a) L-arginine or

b) D-arginine or

c) L-lysine or

d) D-lysine or

e) L-ornithine or

f) D-ornithine,

wherein (NH-X^2-C=O) is a cyclic, nonpolar amino acid, preferably

a) L-cyclohexylalanine or

b) D-cyclohexylalanine or

c) L-cyclohexylglycine or

d) D-cyclohexylglycine,

wherein (NH-X^3-C=O) is any arbitrary D- or L-amino acid, preferably

a) L-norleucine or

b) D-norleucine or

c) L-leucine or

d) D-leucine or

e) L-isoleucine or

f) D-isoleucine or

g) L-cyclohexylalanine or

h) D-cyclohexylalanine or

i) L-cyclohexylglycine or

j) D-cyclohexylglycine or

k) L-proline or

l) D-proline or

m) L-aspartic acid or

n) D-aspartic acid or

o) L-glutamic acid or

p) D-glutamic acid,

wherein (NH-X^4-C=O) is a cyclic amino acid, preferably

a) L-cyclohexylalanine or

b) D-cyclohexylalanine or

c) L-cyclohexylglycine or

d) D-cyclohexylglycine or

e) L-tyrosine or

f) D-tyrosine or

g) L-phenylalanine or

h) D-phenylalanine,

wherein (NH-X^5-C=O) is an amino acid with a polar side chain, preferably

a) L-glutamine or

b) D-glutamine or

c) L-ornithine or

d) D-ornithine or

e) L-glutamic acid or

f) D-glutamic acid or

g) L-arginine or

h) D-arginine or

i) L-lysine or

j) D-lysine or

k) L-asparagine or

l) D-asparagine or

m) L-aspartic acid or

n) D-aspartic acid or

o) is replaced by a chemical bond,

wherein (NH-X^6-C=O) is any arbitrary D- or L-amino acid, preferably

a) L-arginine or

b) D-arginine or

c) is replaced by a chemical bond,

wherein Y^2 is either

a) an OH group (the C-terminal amino acid has a terminal carboxylic acid group) or

b) an amino group (the carboxylic acid group in the C-terminal amino acid is replaced by an amide group) or

c) a hydrogen (the carboxylic acid group in the C-terminal amino acid is replaced by an aldehyde group) or

d) 7-amido-4-methylcoumarin (combined through the carboxylic acid group) or

e) para-nitroanilide (combined through the carboxylic acid group) or

f) is replaced by a connecting chain containing 1 to 35 atoms,

or is a molecule shortened at the C-terminus and/or at the N-terminus by no fewer than one amino acid, and pharmaceutically acceptable salts thereof.

2. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-(NH-X^3-C=O)-(NH-X^4-C=O)-(NH-X^5C=O) (NH-X^6-C=O)-Y^2 with the aforementioned meanings and pharmaceutically acceptable salts thereof.

3. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-L-Nle-L-Cha-D-Gln amide and pharmaceutically acceptable salts thereof.

4. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-L-Asp-L-

Cha-amide and pharmaceutically acceptable salts thereof.

5. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-L-Nle-L-Cha-L-Orn amide and pharmaceutically acceptable salts thereof.

6. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-L-Cha-L-Cha-D-Glu amide and pharmaceutically acceptable salts thereof.

7. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

8. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-L-Cha-L-Cha-L-Orn amide and pharmaceutically acceptable salts thereof.

9. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-L-Nle-L-Cha amide and pharmaceutically acceptable salts thereof.

10. The compound according to claim 1, comprising N-Acetyl-L-Arg-L-Cha-L-Nle-L-Cha-D-Glu amide and pharmaceutically acceptable salts thereof.

11. A compound mixture, comprising two or more compounds according to claim 1.

12. The pharmaceutically acceptable salt according to claim 1, wherein the salt is formed with an inorganic acid.

13. The pharmaceutically acceptable salt according to claim 12, wherein the inorganic acid is selected from the group consisting of hydrochloric acid, bromic acid, a halogen acid, and combinations thereof.

14. The pharmaceutically acceptable salt according to claim 12, wherein the inorganic acid is selected from the group consisting of sulfuric acid, phosphoric, and

combinations thereof.

15. The pharmaceutically acceptable salt according to claim 1, wherein the salt is formed with an organic acid.

16. The pharmaceutically acceptable salt according to claim 15, wherein the organic acid is selected from the group consisting of acetic acid, propionic acid, malonic acid, maleic acid, citric acid, succinic acid, malic acid, benzoic acid, fumaric acid, a similar carboxylic acid, and combinations thereof.

17. A medication, comprising one or more compounds according to claim 1 and a component selected from the group consisting of conventional carriers, auxiliaries, additives, and combinations thereof.

18. A diagnostic composition, comprising one or more compounds according to claim 1.

19. A method for thrombin inhibition, inhibition of fibrin formation, and for the inhibition of agglutinative thrombus formation in human and animals, which method comprises administering an effective amount of a compound according to claim 1.

20. A method for the preparation of a diagnostic composition, wherein the preparation comprises one or more compounds according to claim 1.

21. The method according to claim 20, wherein Y^2 of the compound of formula (I) is 7-amido-4-methylcoumarin.

22. The method according to claim 20, wherein Y^2 of the compound of formula (I) is para-nitroanilide.

23. A method for thrombin inhibition in human and animals, which method comprises administering an effective amount of a compound according to claim 1.

24. A pharmaceutical composition comprising an effective thrombus-preventing amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

25. A diagnostic method for thrombin inhibition in humans and mammals, which method comprises administering an effective amount of a compound according to claim 1.

26. A compound of formula (II)

Y^1-(NH-X^1-C=O)-(NH-X^2-C=O)-(NH-X^3-C=O)-(NH-X^4-C=O)-
(NH-X^5-C=O)-(NH-X^6-C=O)-Y^2 (II),

wherein Y^1 is either

a) a hydrogen or

b) a methyl group or

c) an acetyl group or

d) is characterized by a backbone consisting of a chain of 1 to 32 carbon atoms, wherein (NH-X^1-C=O) is a D- or L-amino acid, preferably

a) valine or

b) alanine or

c) leucine or

d) isoleucine or

e) norleucine or

f) aspartic acid or

g) glutamic acid or

h) serine or

i) threonine or

j) tyrosine or

k) arginine or

l) lysine or

m) ornithine or

n) is replaced by a chemical bond,

wherein (NH-X^2-C=O) is a D- or L-amino acid, preferably

a) alanine or

b) valine or

c) leucine or

d) isoleucine or

e) norleucine or

f) serine or

g) threonine or

h) tyrosine or

i) proline or

j) citrulline or

k) arginine or

l) lysine or

m) ornithine or

n) cyclohexylalanine or

o) cyclohexylglycine or

p) is replaced by a chemical bond,

wherein (NH-X^3-C=O) is any arbitrary amino acid, preferably

a) L-cyclohexylalanine or

b) D-cyclohexylalanine or

c) L-cyclohexylglycine or

d) D-cyclohexylglycine,

wherein (NH-X^4-C=O) is a small amino acid, preferably

a) L-proline or

b) D-proline or

c) is replaced by a chemical bond,

wherein (NH-X^5-C=O) is any arbitrary amino acid, preferably

a) L-tyrosine or

b) D-tyrosine or

c) L-phenylalanine or

d) D-phenylalanine or

e) is replaced by a chemical bond,

wherein (NH-X^6-C=O) is an amino acid with a basic side chain, preferably

a) L-arginine or

b) D-arginine or

c) L-lysine or

d) D-lysine or

e) L-ornithine or

f) D-ornithine,

wherein Y^2 is either

a) an OH group (the C-terminal amino acid has a terminal carboxylic acid group) or

b) an amino group (the carboxylic acid group in the C-terminal amino acid is replaced by an amide group) or

c) a hydrogen (the carboxylic acid group in the C-terminal amino acid is replaced by an aldehyde group) or

d) 7-amido-4-methylcoumarin (combined through the carboxylic acid group) or

e) para-nitroanilide (combined through the carboxylic acid group) or

f) is replaced by a connecting chain containing 1 to 35 atoms,

or is a molecule shortened at the C-terminus and/or at the N-terminus by not less than one amino acid, and pharmaceutically acceptable salts thereof.

27. The compound according to claim 26, comprising N-Acetyl-(NH-X^1-C=O)-(NH-X^2-C=O)-L-Cha-D-Pro-D-Tyr-L-Arg amide with the aforementioned meanings and pharmaceutically acceptable salts thereof.

28. The compound according to claim 26, comprising N-Acetyl-D-Val-L-Ala-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

29. The compound according to claim 26, comprising N-Acetyl-L-Asp-L-Ser-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

30. The compound according to claim 26, comprising N-Acetyl-L-Ile-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

31. The compound according to claim 26, comprising N-Acetyl-D-Val-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

32. The compound according to claim 26, comprising N-Acetyl-L-Ser-L-Ser-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

33. The compound according to claim 26, comprising N-Acetyl-D-Lys-D-Pro-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

34. The compound according to claim 26, comprising N-Acetyl-L-Tyr-L-Cit-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

35. The compound according to claim 26, comprising N-Acetyl-L-Ser-D-Val-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

36. The compound according to claim 26, comprising N-Acetyl-L-Ser-L-Ala-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

37. The compound according to claim 26, comprising N-Acetyl-L-Ser-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

38. The compound according to claim 26, comprising N-Acetyl-L-Ser-L-Cha-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

39. The compound according to claim 26, comprising N-Acetyl-D-Lys-L-Nle-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

40. The compound according to claim 26, comprising N-Acetyl-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

41. The compound according to claim 26, comprising N-Acetyl-L-Ser-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

42. The compound according to claim 26, comprising N-Acetyl-L-Ser-D-Glu-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

43. The compound according to claim 26, comprising N-Acetyl-D-Tyr-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

44. A compound mixture, comprising two or more compounds according to claim 26.

45. The pharmaceutically acceptable salt according to claim 26, wherein the salt is formed with an inorganic acid.

46. The pharmaceutically acceptable salt according to claim 45, wherein the inorganic acid is selected from the group consisting of hydrochloric acid, bromic acid, a halogen acid, and combinations thereof.

47. The pharmaceutically acceptable salt according to claim 45, wherein the inorganic acid is selected from the group consisting of sulfuric acid, phosphoric acid, and combinations thereof.

48. The pharmaceutically acceptable salt according to claim 26, wherein the salt is formed with an organic acid.

49. The pharmaceutically acceptable salt according to claim 48, wherein the organic acid is selected from the group consisting of acetic acid, propionic acid, malonic acid, maleic acid, citric acid, succinic acid, malic acid, benzoic acid, fumaric acid, a similar carboxylic acid, and combinations thereof.

50. A medication, comprising one or more compounds according to claim 26 and a component selected from the group consisting of conventional carriers, auxiliaries, additives, and combinations thereof.

51. A diagnostic composition, comprising one or more compounds according to claim 26.

52. A method for thrombin inhibition, inhibition of fibrin formation, and for the inhibition of agglutinative thrombus formation in human and animals which method comprises administering an effective amount of a compound according to claim 26.

53. A method for the preparation of a diagnostic composition, wherein the preparation comprises one or more compounds according to claim 26.

54. The method according to claim 53, wherein Y^2 of the compound of formula (II) is 7-amido-4-methylcoumarin.

55. The method according to claim 53, wherein Y^2 of the compound of formula (II) is para-nitroanilide.

56. A method for thrombin inhibition in humans and animals, which comprises an effective amount of a compound according to claim 26.

57. A pharmaceutical composition comprising an effective thrombus-preventing amount

of a compound according to claim 26 and a pharmaceutically acceptable carrier.

58. A diagnostic method for thrombin inhibition in humans and mammals, which method comprises administering an effective amount of a compound according to claim 26.

59. A compound of formula (III)

Y^1-(NH-X^1-C=O)-(NH-X^2-C=O)-(NH-X^3-C=O)-(NH-X^4-C=O)-
(NH-X^5-C=O)-(NH-X^6-C=O)-Y^2 (III),

wherein Y^1 is either

a) a hydrogen or

b) a methyl group or

c) an acetyl group or

d) is characterized by a backbone consisting of a chain of 1 to 32 carbon atoms,

wherein (NH-X^1-C=O) is a D- or L-amino acid, preferably

a) valine or

b) alanine or

c) leucine or

d) isoleucine or

e) norleucine or

f) asparagine or

g) glutamine or

h) serine or

i) threonine or

j) tyrosine or

k) arginine or

l) lysine or

m) ornithine or

n) is replaced by a chemical bond,

wherein (NH-X^2-C=O) is a D- or L-amino acid, preferably

a) alanine or

b) valine or

c) leucine or

d) isoleucine or

e) norleucine or

f) serine or

g) threonine or

h) tyrosine or

i) proline or

j) citrulline or

k) arginine or

l) lysine or

m) ornithine or

n) histidine or

o) glutamic acid or

p) aspartic acid or

q) tryptophan or

r) cyclohexylalanine or

s) cyclohexylglycine or

t) is replaced by a chemical bond,

wherein (NH-X^3-C=O) is any arbitrary amino acid, preferably

a) L-cyclohexylalanine or

b) D-cyclohexylalanine or

c) L-cyclohexylglycine or

d) D-cyclohexylglycine,

wherein (NH-X^4-C=O) is a small amino acid, preferably

a) L-proline or

b) D-proline or

c) is replaced by a chemical bond,

wherein (NH-X^5-C=O) is any arbitrary amino acid, preferably

a) L-tyrosine or

b) D-tyrosine or

c) L-phenylalanine or

d) D-phenylalanine or

e) is replaced by a chemical bond,

wherein (NH-X^6-C=O) is an amino acid with a basic side chain, preferably

a) L-arginine or

b) D-arginine or

c) L-lysine or

d) D-lysine or

e) L-ornithine or

f) D-ornithine,

wherein Y^2 is either

a) an OH group (the C-terminal amino acid has a terminal carboxylic acid group) or

b) an amino group (the carboxylic acid group in the C-terminal amino acid is replaced by an amide group) or

c) a hydrogen (the carboxylic acid group in the C-terminal amino acid is replaced by an aldehyde group) or

d) 7-amido-4-methylcoumarin or (combined through the carboxylic acid group) or

e) para-nitroanilide (combined through the carboxylic acid group) or

f) is replaced by a connecting chain containing 1 to 35 atoms,

or is a molecule shortened at the C-terminus and/or at the N-terminus by not less than one amino acid, and pharmaceutically acceptable salts thereof.

60. The compound according to claim 59, comprising N-Acetyl-(NH-X^1-C=O)-(NH-X^2-C=O)-L-Cha-D-Pro-D-Tyr-L-Arg amide with the aforementioned meanings and

pharmaceutically acceptable salts thereof.

61. The compound according to claim 59, comprising N-Acetyl-D-Gln-D-His-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

62. The compound according to claim 59, comprising N-Acetyl-D-Glu-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

63. The compound according to claim 59, comprising N-Acetyl-D-Val-D-His-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

64. The compound according to claim 59, comprising N-Acetyl-L-Ala-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

65. The compound according to claim 59, comprising N-Acetyl-L-Ile-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

66. The compound according to claim 59, comprising N-Acetyl-L-Tyr-L-Cit-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

67. The compound according to claim 59, comprising N-Acetyl-L-Ser-L-Ser-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

68. The compound according to claim 59, comprising N-Acetyl-D-Val-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

69. The compound according to claim 59, comprising N-Acetyl-L-Trp-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

70. The compound according to claim 59, comprising N-Acetyl-L-Ser-L-Ala-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

71. The compound according to claim 59, comprising N-Acetyl-L-Ser-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

72. The compound according to claim 59, comprising N-Acetyl-D-Lys-L-Nle-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

73. The compound according to claim 59, comprising N-Acetyl-D-Tyr-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

74. The compound according to claim 59, comprising N-Acetyl-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

75. The compound according to claim 59, comprising N-Acetyl-L-Tyr-D-Pro-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

76. A compound mixture comprising two or more compounds according to claim 59.

77. The pharmaceutically acceptable salt according to claim 59, wherein the salt is formed with an inorganic acid.

78. The pharmaceutically acceptable salt according to claim 77, wherein the inorganic acid is selected from the group consisting of hydrochloric acid, bromic acid, a halogen acid, and combinations thereof.

79. The pharmaceutically acceptable salt according to claim 77, wherein the inorganic acid is selected from the group consisting of sulfuric acid, phosphoric acid, and combination.

80. The pharmaceutically acceptable salt according to claim 59, wherein the salt is formed with an organic acid.

81. The pharmaceutically acceptable salt according to claim 80, wherein the organic acid is selected from the group consisting of acetic acid, propionic acid, malonic acid, maleic acid, citric acid, succinic acid, malic acid, benzoic acid, fumaric acid, a similar carboxylic acid, and combinations thereof.

82. A medication comprising one or more compounds according to claim 59 a component selected from the group consisting of conventional carriers, auxiliaries, additives, and combinations thereof.

83. A diagnostic composition, comprising one or more compounds according to claim 59.

84. A method for thrombin inhibition, inhibition of fibrin formation, and for the inhibition of agglutinative thrombus formation in humans and animals which method comprises an effective amount of a compound according to claim 59.

85. A method for the preparation of a diagnostic composition, wherein the preparation comprises one or more compounds according to claim 59.

86. The method according to claim 85, wherein Y^2 of the compound of formula (III) is 7-amido-4-methylcoumarin.

87. The method according to claim 85, wherein Y^2 of the compound of formula (III) is para-nitroanilide.

88. A method for thrombin inhibition in humans and animals, which method comprises administering an effective amount of a compound according to claim 59.

89. A pharmaceutical composition comprising an effective thrombus-preventing amount of a compound according to claim 59 and a pharmaceutically acceptable carrier.

90. A diagnostic method for thrombin inhibition in humans and mammals, which method comprises administering an effective amount of a compound according to claim 59.

91. A compound of formula (IV)

Y^1-(NH-X^1-C=O)-(NH-X^2-C=O)-(NH-X^3-C=O)-(NH-X^4-C=O)-
(NH-X^5-C=O)-(NH-X^6-C=O)-Y^2 (IV),

wherein Y^1 is either

a) a hydrogen or

b) a methyl group or

c) an acetyl group or

d) is characterized by a backbone consisting of a chain of 1 to 32 carbon atoms,

wherein (NH-X^1-C=O) is a D- or L-amino acid, preferably

a) valine or

b) alanine or

c) leucine or

d) isoleucine or

e) norleucine or

f) asparagine or

g) glutamine or

h) serine or

i) threonine or

j) tyrosine or

k) arginine or

l) lysine or

m) ornithine or

n) is replaced by a chemical bond,

wherein (NH-X^2-C=O) is a D- or L-amino acid, preferably

a) alanine or

b) valine or

c) leucine or

d) isoleucine or

e) norleucine or

f) serine or

g) threonine or

h) tyrosine or

i) proline or

j) citrulline or

k) arginine or

l) lysine or

m) ornithine or

n) histidine or

o) glutamic acid or

p) aspartic acid or

q) tryptophan or

r) cyclohexylalanine or

s) cyclohexylglycine or

t) is replaced by a chemical bond,

wherein (NH-X^3-C=O) is any arbitrary amino acid, preferably

a) L-cyclohexylalanine or

b) D-cyclohexylalanine or

c) L-cyclohexylglycine or

d) D-cyclohexylglycine,

wherein (NH-X^4-C=O) is a small amino acid, preferably

a) L-proline or

b) D-proline or

c) L-azetidine-2-carboxylic acid or

d) D-azetidine-2-carboxylic acid,

wherein (NH-X^5-C=O) is an aromatic amino acid, preferably

a) L-tyrosine or

b) D-tyrosine or

c) L-phenylalanine or

d) D-phenylalanine,

wherein (NH-X^6-C=O) is an amino acid with a basic side chain, preferably

a) L-arginine or

b) D-arginine or

c) L-lysine or

d) D-lysine or

e) L-ornithine or

f) D-ornithine or

g) L-homoarginine or

h) D-homoarginine,

wherein Y^2 is either

a) an OH group (the C-terminal amino acid has a terminal carboxylic acid group) or

b) an amino group (the carboxylic acid group in the C-terminal amino acid is replaced by an amide group) or

c) a hydrogen (the carboxylic acid group in the C-terminal amino acid is replaced by an aldehyde group) or

d) 7-amido-4-methylcoumarin or (combined through the carboxylic acid group) or

e) para-nitroanilide (combined through the carboxylic acid group) or

f) is replaced by a connecting chain containing 1 to 35 atoms,

or is a molecule shortened at the C-terminus and/or at the N-terminus by not less than one amino acid, and pharmaceutically acceptable salts thereof.

92. The compound according to claim 91, comprising N-Acetyl-(NH-X^1-C=O)-(NH-X^2-C=O)-L-Cha-D-Pro-D-Tyr-L-Arg amide with the aforementioned meanings and

pharmaceutically acceptable salts thereof.

93. The compound according to claim 91, comprising N-Acetyl-D-Gln-D-His-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

94. The compound according to claim 91, comprising N-Acetyl-D-Glu-L-Cha-D-Pro-D-Tyr-L-Arg-amide and pharmaceutically acceptable salts thereof.

95. The compound according to claim 91, comprising N-Acetyl-D-Val-D-His-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

96. The compound according to claim 91, comprising N-Acetyl-L-Ala-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

97. The compound according to claim 91, comprising N-Acetyl-L-Ile-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

98. The compound according to claim 91, comprising N-Acetyl-L-Tyr-L-Cit-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

99. The compound according to claim 91, comprising N-Acetyl-L-Ser-L-Ser-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

100. The compound according to claim 91, comprising N-Acetyl-D-Val-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

101. The compound according to claim 91, comprising N-Acetyl-L-Trp-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

102. The compound according to claim 91, comprising N-Acetyl-L-Ser-L-Ala-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

103. The compound according to claim 91, comprising N-Acetyl-L-Ser-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

104. The compound according to claim 91, comprising N-Acetyl-D-Lys-L-Nle-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

105. The compound according to claim 91, comprising N-Acetyl-D-Tyr-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

106. The compound according to claim 91, comprising N-Acetyl-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

107. The compound according to claim 91, comprising N-Acetyl-L-Tyr-D-Pro-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

108. The compound according to claim 91, comprising N-Acetyl-L-Ala-D-Cha-L-Aze-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

109. The compound according to claim 91, comprising N-Acetyl-L-Ala-D-Cha-L-Pro-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

110. The compound according to claim 91, comprising N-Acetyl-L-Ala-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

111. A compound mixture comprising two or more compounds according to claim 91.

112. The pharmaceutically acceptable salt according to claim 91, wherein the salt is formed with an inorganic acid.

113. The pharmaceutically acceptable salt according to claim 112, wherein the inorganic

acid is selected from the group consisting of hydrochloric acid, bromic acid, a halogen acid, and combinations thereof.

114. The pharmaceutically acceptable salt according to claim 112, wherein the inorganic acid is selected from the group consisting of sulfuric acid, phosphoric acid, and combinations thereof.

115. The pharmaceutically acceptable salt according to claim 91, wherein the salt is formed with an organic acid.

116. The pharmaceutically acceptable salt according to claim 115, wherein the organic acid is selected from the group consisting of acetic acid, propionic acid, malonic acid, maleic acid, citric acid, succinic acid, malic acid, benzoic acid, fumaric acid, a similar carboxylic acid, and combinations thereof.

117. A medication, comprising one or more compounds according to claim 91 and a component selected from the group consisting of conventional carriers, auxiliaries, additives, and combinations thereof.

118. A diagnostic composition, comprising one or more compounds according to claim 91.

119. A method for thrombin inhibition, inhibition of fibrin formation, and for the inhibition of agglutinative thrombus formation, in humans and animals which method comprises administering an effective amount of a compound according to claim 91.

120. A method for the preparation of a diagnostic composition, wherein the preparation comprises one or more compounds according to claim 91.

121. The method according to claim 120, wherein Y^2 of the compound of formula (IV) is 7-amido-4-methylcoumarin.

122. The method according to claim 120, wherein Y^2 of the compound of formula (IV) is para-nitroanilide.

123. A method for thrombin inhibition in human and animals, which method comprises administering an effective amount of a compound according to claim 91.

124. A pharmaceutical composition comprising an effective thrombus-preventing amount of a compound according to claim 91 and a pharmaceutically acceptable carrier.

125. A diagnostic method for thrombin inhibition in humans and mammals, which method comprises administering an effective amount of a compound according to claim 91.

126. A compound of formula (V)

$$Y^1\text{-}(NH\text{-}X^1\text{-}C{=}O)\text{-}(NH\text{-}X^2\text{-}C{=}O)\text{-}(NH\text{-}X^3\text{-}C{=}O)\text{-}(NH\text{-}X^4\text{-}C{=}O)\text{-}(NH\text{-}X^5\text{-}C{=}O)\text{-}(NH\text{-}X^6\text{-}C{=}O)\text{-}Y^2 \quad \text{(V)},$$

wherein Y^1 is either

a) a hydrogen or

b) a methyl group or

c) an acetyl group or

d) is characterized by a backbone consisting of a chain of 1 to 32 carbon atoms, wherein $(NH\text{-}X^1\text{-}C{=}O)$ is a D- or L-amino acid, preferably

a) valine or

b) alanine or

c) leucine or

d) isoleucine or

e) norleucine or

f) asparagine or

g) glutamine or

h) serine or

i) threonine or

j) tyrosine or

k) arginine or

l) lysine or

m) ornithine or

n) phenylalanine or

o) dichlorophenylalanine or

p) tetrahydronorharman-3-carboxylic acid or

q) 1,2,3,4-tetrahydroisoquinoline-3-carboxylic acid or

r) 4-phenylpiperidine-4-carboxylic acid or

s) thienylalanine or

t) phenylglycine or

u) p-nitrophenylalanine or

v) is replaced by a chemical bond,

wherein (NH-X^2-C=O) is a D- or L-amino acid, preferably

a) alanine or

b) valine or

c) leucine or

d) isoleucine or

e) norleucine or

f) serine or

g) threonine or

h) tyrosine or

i) proline or

j) citrulline or

k) arginine or

l) lysine or

m) ornithine or

n) histidine or

o) glutamic acid or

p) aspartic acid or

q) tryptophan or

r) cyclohexylalanine or

s) cyclohexylglycine or

t) is replaced by a chemical bond,

wherein (NH-X^3-C=O) is any arbitrary amino acid, preferably

a) L-cyclohexylalanine or

b) D-cyclohexylalanine or

c) L-cyclohexylglycine or

d) D-cyclohexylglycine,

wherein (NH-X^4-C=O) is a small amino acid, preferably

a) L-proline or

b) D-proline or

c) L-azetidine-2-carboxylic acid or

d) D-azetidine-2-carboxylic acid,

wherein (NH-X^5-C=O) is an aromatic amino acid, preferably

a) L-tyrosine or

b) D-tyrosine or

c) L-phenylalanine or

d) D-phenylalanine,

wherein (NH-X^6-C=O) is an amino acid with a basic side chain, preferably

a) L-arginine or

b) D-arginine or

c) L-lysine or

d) D-lysine or

e) L-ornithine or

f) D-ornithine or

g) L-homoarginine or

h) D-homoarginine,

wherein Y^2 is either

a) an OH group (the C-terminal amino acid has a terminal carboxylic acid group) or

b) an amino group (the carboxylic acid group in the C-terminal amino acid is replaced by an amide group) or

c) a hydrogen (the carboxylic acid group in the C-terminal amino acid is replaced by an aldehyde group) or

d) 7-amido-4-methylcoumarin or (combined through the carboxylic acid group) or

e) para-nitroanilide (combined through the carboxylic acid group) or

f) is replaced by a connecting chain containing 1 to 35 atoms,

or is a molecule shortened at the C-terminus and/or at the N-terminus by not less than one amino acid, and pharmaceutically acceptable salts thereof.

127. The compound according to claim 126, comprising N-Acetyl-(NH-X^1-C=O)-(NH-X^2-C=O)-L-Cha-D-Pro-D-Tyr-L-Arg amide with the aforementioned meanings and pharmaceutically acceptable salts thereof.

128. The compound according to claim 126, comprising N-Acetyl-D-Gln-D-His-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

129. The compound according to claim 126, comprising N-Acetyl-D-Glu-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

130. The compound according to claim 126, comprising N-Acetyl-D-Val-D-His-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

131. The compound according to claim 126, comprising N-Acetyl-L-Ala-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

132. The compound according to claim 126, comprising N-Acetyl-L-Ile-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

133. The compound according to claim 126, comprising N-Acetyl-L-Tyr-L-Cit-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

134. The compound according to claim 126, comprising N-Acetyl-L-Ser-L-Ser-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

135. The compound according to claim 126, comprising N-Acetyl-D-Val-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

136. The compound according to claim 126, comprising N-Acetyl-L-Trp-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

137. The compound according to claim 126, comprising N-Acetyl-L-Ser-L-Ala-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

138. The compound according to claim 126, comprising N-Acetyl-L-Ser-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

139. The compound according to claim 126, comprising N-Acetyl-D-Lys-L-Nle-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

140. The compound according to claim 126, comprising N-Acetyl-D-Tyr-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

141. The compound according to claim 126, comprising N-Acetyl-L-Arg-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

142. The compound according to claim 126, comprising N-Acetyl-L-Tyr-D-Pro-L-Cha-D-Pro-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

143. The compound according to claim 126, comprising N-Acetyl-L-Ala-D-Cha-L-Aze-D-Tyr-L-Arg amide and pharmaceutically acceptable salts thereof.

144. The compound according to claim 126, comprising N-Acetyl-L-Ala-D-Cha-L-Pro-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

145. The compound according to claim 126, comprising N-Acetyl-L-Trp-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

146. The compound according to claim 126, comprising N-Acetyl-L-Ala-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

147. The compound according to claim 126, comprising N-Acetyl-L-Phe-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

148. The compound according to claim 126, comprising N-Acetyl-L-Dcp-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

149. The compound according to claim 126, comprising N-Acetyl-L-Nhm-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

150. The compound according to claim 126, comprising N-Acetyl-L-Iq3-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

151. The compound according to claim 126, comprising N-Acetyl-L-Ppd-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

152. The compound according to claim 126, comprising N-Acetyl-L-Tea-D-Cha-L-Aze-D-

Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

153. The compound according to claim 126, comprising N-Acetyl-L-Phg-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

154. The compound according to claim 126, comprising N-Acetyl-L-Nle-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

155. The compound according to claim 126, comprising N-Acetyl-L-Cha-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

156. The compound according to claim 126, comprising N-Acetyl-L-Pnp-D-Cha-L-Aze-D-Tyr-L-Har amide and pharmaceutically acceptable salts thereof.

157. A compound mixture, comprising two or more compounds according to claim 126.

158. The pharmaceutically acceptable salt according to claim 126, wherein the salt is formed with an inorganic acid.

159. The pharmaceutically acceptable salt according to claim 158, wherein the inorganic acid is selected from the group consisting of hydrochloric acid, bromic acid, a halogen acid, and combinations thereof.

160. The pharmaceutically acceptable salt according to claim 158, wherein the inorganic acid is selected from the group consisting of sulfuric acid, phosphoric, and combinations thereof .

161. The pharmaceutically acceptable salt according to claim 126, wherein the salt is formed with an organic acid.

162. The pharmaceutically acceptable salt according to claim 161, wherein the organic

acid is selected from the group consisting of acetic acid, propionic acid, malonic acid, maleic acid, citric acid, succinic acid, malic acid, benzoic acid, fumaric acid, a similar carboxylic acid, and combinations thereof.

163. A medication, comprising one or more compounds according to claim 126 and a component selected from the group consisting of conventional carriers, auxiliaries, additives, and combinations thereof.

164. A diagnostic composition, comprising one or more compounds according to claim 126.

165. A method for thrombin inhibition, inhibition of fibrin formation, and for the inhibition of agglutinative thrombus formation in human and animals, which method comprises administering an effective amount of a compound according to claim 126.

166. A method for the preparation of a diagnostic composition, wherein the preparation comprises one or more compounds according to claim 126.

167. The method according to claim 166, wherein Y^2 of the compound of formula (V) is 7-amido-4-methylcoumarin.

168. The method according to claim 166 , wherein Y^2 of the compound of formula (V) is para-nitroanilide.

169. A method for thrombin inhibition in human and animals, which method comprises administering an effective amount of a compound according to claim 126.

170. A pharmaceutical composition comprising an effective thrombus-preventing amount of a compound according to claim 126 and a pharmaceutically acceptable carrier.

171. A diagnostic method for thrombin inhibition in humans and mammals, which method

comprises administering an effective amount of a compound according to claim 126.